the fact that they receive only a fraction of the funding.

One can hope that the alternative techniques to produce embryonic-type (pluripotent) stern cells are soon perfected and that in the near future we will have a workable method to produce embryonic stern cells without destroying living human embryos. Even when that is accomplished (studies are being reviewed as we speak), the resulting cells will still have the same cancerous-tumor-formation problem that all embryonic stern cells possess. This leaves one question: Given the severe ethical problems with current methods of embryonic stern-cell research and the inherent scientific problems with tumor formation, why have they been hyped to such a large extent while adult sterns have gone unnoticed? One can only guess.

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Pamphlet 341

# The Truth About

# Embryonic Stem Cell (ESC) Therapies

Ryan T. Anderson

The truth about the technical challenges and scientific hurdles for embryonic stern-cell (ESC) therapies is finally getting out.

The truth, of course, is that there are no human embryonic stern-cell therapies even in clinical trial, let alone ready for therapy, and there have been no major treatment models in animals, either. Adult stern cells, however, have already been successful in treating more than seventy different diseases in actual human beings.

Readers of FIRST THINGS are well aware that the main objection to current methods of embryonic stern-cell research is that they involve the destruction of living human embryos, that is, human beings at the embryonic stage in their lives. This is a principled objection to the direct and intentional killing of human beings.

There is no principled objection to stem cell research, not even to *embryonic* stem cell research, provided that methods that do not destroy embryos are pursued. In fact, the May 2006 issue of FIRST THINGS ran an article by E. Christian Brugger explaining and defending one such method, Altered Nuclear Transfer - Acolyte Assisted Reproduction (ANT -OAR), which has received broad support from the pro-life intellectual community. There are also techniques to dedifferentiate (reprogram) an adult somatic cell back to a state of

pluripotency (in other words, to convert it directly to an embryonic-like stem cell). In both these methods, no embryos are created, no embryos are destroyed. All citizens could in good faith support these methods of producing embryonic-type (pluripotent) stem cells.

Many still persist in preferring embryonic stem-cell research-but why? Some have claimed that because the cells are younger and undifferentiated, they will be more malleable and capable of being turned into any tissue type. Furthermore, given cloning technologies, embryonic stem cells could be created from cloned human embryos (cloned from the patient) and thus avoid the risk of immune rejection. (As a separate argument, some research scientists argue that work with embryonic stem cells will advance knowledge of cellular biology, but this is a separate claim from the trumpeting - indeed, hyping - of supposed direct therapeutic uses of embryonic stem cells made in recent years.)

Leaders in the stem-cell community, however, are beginning to speak out about scientific hurdles embryonic stem-cell therapies face. Not surprisingly, the mainstream media in the United States has chosen to ignore it.

Luckily, the Australian media has been paying attention. The *Australian* ran a series of articles this week about Dr. James Sherley, associate professor of biological engineering at the Massachusetts Institute of Technology (MIT), who is lecturing in Australia about stem cells and cloning. The *Australian* reports "concern about scientific dishonesty had driven him out of his Massachusetts Institute of Technology laboratory and into the public debate." Why? The *Australian* summarizes, "supporters of embryonic stem cell research ignored evidence that adult stem cells had far greater potential, if they could be produced in large quantities." Sherley is now at work on methods to mass produce these cells.

Sherley argues that adult stem cells present greater promise for medicinal cures because they are already specialized into the tissue-type needed, and - because they are harvested directly from the patient in need of therapy - they have the same genotype and thus avoid the risk of immune rejection (without need for cloning or embryo destruction). As Sherley put it: "If you have a problem with your liver, you need a liver stem cell, you don't need an embryonic stem cell."

Embryonic stem cells, meanwhile, have several major problems, notably - and seldom mentioned - they cause tumors and form cancerous growths. Sherley explains it this way: "When you put them [ESC] in an environment where they can grow and develop, they make lots of different kind of tissues. This tumor formation property is an inherent feature of the cells. And all you have to do is simply inject them into an animal tissue - this happens at very high efficiency." Currently, there are no solutions to this problem on the horizon. As Sherley put it: "And although some might say we can solve the tumor problem down the road, that's equivalent to saying we can solve the cancer problem, and we may, but that's a long time coming."

Ironically, pointing out this *scientific* concern will no doubt result in being labeled "anti-science" or "science-phobic." Sherley recognizes that pressure from the media and from patient groups desperate for cures who have had their hopes raised by hype from politicians and members of the scientific community has led other scientists to fear speaking out. The *Australian* reports:
"Sherley said many scientists agreed with his views but were too scared to speak out over concerns it could affect their funding and reputation."

If you doubt this is the case, one need only look to the California Institute for Regenerative Medicine (CIRM) - the multibillion-dollar institute dedicated to embryonic stem-cell research on the California taxpayers' dime - and their recent proposed strategic report. The report states: "[I]t is unlikely that CIRM will be able to fully develop stem cell therapy for routine clinical use during the ten years of the plan. Within that time span, however, we will be able to advance therapies for several diseases to early stage clinical trials, and to have therapies for other diseases in the pipeline." For the next ten years, the *best* they can promise is "early stage clinical trials" and therapies "in the pipeline." The *Mercury News* in an article last week reports that the Institute's president, Zach Hall, "predicted it might take 15 years before the institute's research results in a medical product." Meanwhile, adult stem-cell therapies are healing patients now – despite